Corporate Report

NO: R034

COUNCIL DATE: February 23, 2004

REGULAR COUNCIL

TO:	**Mayor & Council**	DATE:	**February 17, 2004**
FROM:	**General Manager, Engineering**	FILE:	**7802-0104-00** **7802 0403-00**
SUBJECT:	**Groundwater and Soil Concerns Related to Developments North of 64 Avenue, 140 Street to 142 Street**		

RECOMMENDATIONS

It is recommended that Council:

1. Receive this report; and

2. Instruct staff to ensure that the site servicing for each development includes all the appropriate design and construction measures mentioned in the groundwater and soil reports submitted by each applicant.

BACKGROUND

Council at the January 26, 2004 Public Hearing, instructed the Engineering Department to provide a report on the issues raised at the Public Hearing for the two development applications at 14023 – 64 Avenue (7802-0104-00) and 6455/93 – 142 Street (7802 0403-00).

DISCUSSION

Both development sites are located between Hyland Creek to the north and Archibald Creek to the south, where the soil:

- consists of a thick layer of soft waterlogged clay, not too far below the ground surface, which has the potential to trap surface water;
- contains aquifers and springs which keep the soil wet;
- is usually wet because of water, either trapped by the clay layer or being discharged by the springs, is present at or just below the ground surface.

The result of these conditions is that any natural/undeveloped area will have extensive surface ponding in wet weather.

Normally, an applicant would wait until Council has granted Third Reading before the applicant would retain engineering consultants to address specific site issues. Because of the concerns expressed, regarding groundwater and soil conditions, by the neighbours through the Planning and Development Public Information Meetings, the two applicants individually retained civil, groundwater and soil consultants to address these concerns.

Additionally, in December 2003, the Engineering Department retained EBA Engineering Consultants Ltd., a consulting firm with expertise in both groundwater and soil engineering, to conduct an independent review of the groundwater and soil reports submitted by the two applicants. This independent review suggested action items for the applicants' consultants to review, clarify and/or confirm. Prior to the Public Hearing, the applicants' consultants addressed each of these action items to the satisfaction of the Engineering Department, with the exception of those which can only be resolved as part of the design phase of the projects (e.g. final lot grading which will determine acceptable potential settlements).

Concern #1 – Existing Condition

The delegations at the Public Hearing insist that the previous development at 142 Street and 65 Avenue (Turnberry, 7800-0213-00), which began site servicing construction in August 2001 with the last house constructed in May 2003, have added so much weight on the soil that the groundwater was squeezed out of the soil and into the nearby houses and yards (Smarz, 14084 – 65 Avenue and Samborski, 14092 – 65 Avenue) causing surface ponding and houses to settle and crack. (See attached plan.)

It is worth noting that the delegations live in a subdivision at 65 Avenue and 140A Street, which was serviced in the mid- to late-1980's. The soil report submitted for this development, although not as thorough as the two current subject developments, has also indicated the presence of water just below the ground surface, which is similar to the Turnberry development and the two proposed developments.

The applicants' consultants have indicated that, given the groundwater and soil conditions, it is unlikely that proposed site servicing and house construction can cause groundwater to be squeezed out of the soil and flood the crawl spaces and yards of adjacent properties. With that in mind, it would also be unlikely that the Turnberry development has caused the water ponding condition, as indicated by the delegations.

The Parks and Engineering Departments have carried out minor works to improve drainage in the open space area.

It is possible that the ponding of water that has occurred is likely to continue to occur because the aquifer and springs in the soil will continue to keep the soil wet and the water at or just below ground surface. Additional shallow drainage would substantially reduce the amount of surface ponding.

Concern #2 – Future Condition

The delegations are also concerned about the groundwater situation being made worse by further development. In addition, they want to feel safe that construction vibration will be tolerable and will not cause damage to their houses.

The groundwater report highlighted the importance to avoid significantly altering the groundwater pattern in the area so as to control the water pressure in the soil. The applicants' consultants have determined that special design and construction considerations are appropriate to suit these developments, such as the following:

- maintain the current groundwater condition as much as possible;
- construct perforated pipes at the rear of the proposed lots to prevent water from ponding but shallow enough to deal with the fluctuating low summer or high winter water table; and
- construct low permeable barriers in the utility trenches to prevent groundwater from quickly draining away, through the granular trench backfill.

The concern related to the effects of construction has also been addressed. The applicants have volunteered to:

- conduct pre-construction inspection of the existing houses and properties; and
- monitor the level of vibration generated by site servicing construction activities and modify construction methods as necessary to keep the vibration to an acceptable level.

CONCLUSION

Development Applications 7802-0104-00 and 7802-0403-00 are both located in an area of challenging ground conditions. The applicants have retained appropriate civil, groundwater and soil consultants have provided adequate and sufficient information to date, and have satisfied the Engineering Department that the proposed development of these properties will not worsen the groundwater condition in the area. Care has also been taken to address the soil condition, as related to vibration and construction methods.

The applicants' consultants will be responsible for designing and monitoring the construction of the works necessary to deal with the groundwater and soil conditions and ensuring that there is minimal impact to adjacent properties. With these safeguards in place, there is no technical reason why the two proposed developments should not proceed.

Paul Ham, P.Eng.
General Manager, Engineering

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Attachments

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